

Application No. 10/585629  
Responsive to the office action dated March 1, 2010

### REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Claim 1 has been amended to include the limitations of original claim 6 and further amended as supported by the specification at page 50, lines 3-9 and page 53, lines 5-9. The sealed reflux condition is clear from the above listed disclosures in the specification. Claim 4 has been amended to include the limitations of original claim 6 corresponding to the amendments to claim 1 discussed above. Accordingly, claim 6 has been canceled, and claims 7-9 have been amended editorially. No new issues are raised by the amendments to the claims.

Claims 1-9 have been rejected under 35 U.S.C. 112, first paragraph, as not complying with the enablement requirement. Applicants respectfully traverse this rejection.

Current base claim 1 limits the catalyst to an activated mixed catalyst of a palladium catalyst and a platinum catalyst as suggested in the Office Action mailed March 1, 2010, and claim 1 further recites that the aromatic compound reacts under the sealed reflux condition. The activated mixed catalyst and sealed reflux reaction condition are used in examples 1-8 of the specification (see examples 1-8 and tables 1-8 on pages 53-60 of the specification). Accordingly, claim 1 and claims 2-5 and 7-9, which ultimately depend from claim 1, satisfy the enablement requirement, and this rejection should be withdrawn. Claim 6 has been canceled without prejudice.

Claims 1-10 and 12 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Sajiki et al. (Synlett 2002, 7, 1149-1151) in view of Kozo HIROTA et al. (Bull. Chem. Soc. Japan 1962, 2, 228-232). Applicants respectfully traverse this rejection.

Claim 1 recites that the aromatic compound reacts in the presence of an activated mixed catalyst of a palladium (Pd) catalyst and a platinum (Pt) catalyst under a sealed

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reflux condition. Sajiki discloses a method of deuterating hydrogen atoms in a benzylic position of diphenylmethane using the deuteration conditions of a room temperature under sealed ordinary hydrogen atmosphere with Pd/C-catalyst (see page 1149, left coln. lines 25-27 and right coln., lines 6-11). Sajiki, however, fails to disclose use of the activated mixed catalyst of the Pd and Pt catalysts as claim 1 recites. In addition, the purpose of Sajiki is to provide a deuteration method that does not require severe conditions such as high heat, high pressure, etc. (see page 1149, left coln. lines 16-27). The sealed reflux condition of the deuteration method of claim 1 generally requires higher temperature than the room temperature used in Sajiki (see page 50, lines 3-9, page 53, lines 5-10, and examples 1-8 on pages 53-60 of the specification). Accordingly, claim 1 is distinguished from Sajiki also in this respect. Sajiki discloses a distinct method with which hydrogen atoms in the benzylic position are deuterated selectively (see page 1149, left coln., lines 25-27). In the invention of claim 1, using the activated mixed catalyst of the Pd and Pt catalysts, in addition to hydrogen atoms in the benzylic position, hydrogen atoms directly bound to the aromatic ring and hydrogen atoms of the substituents of the aromatic ring other than in the benzylic position can be deuterated at a significantly higher yield than the deuteration reaction using the activated Pd catalyst alone (see examples 1-7 and comparative examples 1-1, 2-1, 3-1, 4-1, 5-1, 6-1, and 7-1 in tables 1-7 on pages 54-59 of the specification). Such high deuteration ratios of hydrogen atoms directly bound to the aromatic ring and those of the substituent of the aromatic ring other than in the benzylic position obtained by the method of claim 1 are unexpected from Sajiki. Accordingly, claim 1 is distinguished from Sajiki.

Kozo HIROTA discloses methods of deuterating p-xylene at 80°C or 100°C in the presence of Pt black or at 100°C in the presence of Pd black as a catalyst (see experiments 10-12 in table 1 on page 230). The reaction temperature of Hirota's method is a boiling point of water or lower, and Hirota is silent about reaction pressure. Thus, Hirota does not disclose the sealed reflux condition. In addition, the Pt catalyst and Pd catalyst used in the method of Hirota are not activated and are used in separate reactions, i.e., the catalyst is not a mixed catalyst of Pt and Pd catalysts. Thus, Hirota fails to disclose that the compound reacts in the presence of an activated mixed catalyst of the Pd catalyst and Pt catalyst under sealed reflux condition as claim 1 recites. Accordingly,

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Hirota does not remedy the deficiencies of Sajiki. Further, by the method of Hirota using Pt black or Pd black, the average deuteration ratios are lower than 40 % (see table III on page 231). In Hirota, the deuteration ratios of hydrogen atoms directly bound to the benzene ring are 15 % (with Pt black) and 9 % (with Pd black), and the ratios of hydrogen atoms in methyl groups are 23 % (with Pt black) and 30 % (with Pd black) (see table IV-B on page 231). Thus, the deuteration ratios of Hirota are not comparable to those of claim 1, which are mostly higher than 90 % except for example 3 and one position in examples 4, 6, and 8 (see tables 1-8 on pages 54-60 of the specification). Such high deuteration ratios obtained by the method of claim 1 are not expected from Hirota.

Further, even if Sajiki and Hirota were combined, the combination would not disclose the sealed reflux condition of the reaction as discussed above. In addition, the combination of Sajiki, which discloses an activated Pd/C catalyst (see page 1149, right coln. lines 6-11), and Hirota, which discloses use of either the inactivated Pt black or inactivated Pd black (see table 1 on page 230), does not teach or suggest use of the activated mixed catalyst of the Pd catalyst and Pt catalyst. Even if both Pd catalyst and Pt catalyst were activated, high deuteration ratios in all positions of the compound cannot be obtained unless the activated catalyst of the Pd and Pt catalysts are used as an activated mixed catalyst as claim 1 recites (see example 1 and comparative example 1-3 in table 1 on page 54 of the specification). When the activated Pd catalyst and activated Pt catalyst are used consecutively, the deuteration ratio of position (2) of the aromatic ring is significantly lower than that obtained with the activated mixed catalyst (see *id.*). The high deuteration ratios in all positions of the compound, which can be obtained by the particular type of the activated Pd and Pt catalyst, i.e., the activated mixed catalyst of the Pd and Pt catalysts, are unexpected from the combination of Sajiki and Hirota. Accordingly, claim 1 and claims 2-5 and 7-10 and 12, which ultimately depend from claim 1, are distinguished from Sajiki in view of Hirota, and this rejection should be withdrawn.

Applicants respectfully note that the grounds of the rejections of claims 11 and 13 are not provided in the Office Action mailed March 1, 2010. Even if claim 11 and claim

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13 were included in the enablement rejection, claim 11 and claim 13, which depend from claim 1 and are supported by the specification at page 3, line 29 – page 4, line 13 and page 11, line 18 – page 12, line 7 and at page 3, line 29 – page 4, line 13 and page 5, lines 7-26, respectively, would satisfy the enablement requirement. Further, these claims are distinguished from Sajiki in view of Hirota for at least the same reasons as discussed above for claim 1, from which claims 11 and 13 depend.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.



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